ALASKA

Contact Information

Kent Patrick-Riley, Section Leader - NPS Protection and Impairment
Alaska Department of Environmental Conservation (ADEC)
555 Cordova Street ■ Anchorage, AK 99501
Phone 907/269-7554 ■ Fax 907/269-7508
email: kent_patrick-riley@envircon.state.ak.us
ADEC Division of Air and Water Quality homepage:
http://www.state.ak.us/local/akpages/ENV.CONSERV/dawq/dec_dawq.htm

Program Description

The State of Alaska is in the early stages of using bioassessments in water quality management. The lead agency funding bioassessment work is the Alaska Department of Environmental Conservation (ADEC); with the bulk of the development work done by the University of Alaska (UAA) Environment and Natural Resources Institute (ENRI). To date, bioassessments have not been used for biocriteria. Key accomplishments of Alaska's program include:

- method development and testing, resulting in the Alaska Stream Condition Index
- successful interagency involvement and supplemental funding
- extensive outreach and educational opportunities
- development of regional reference conditions for the Cook Inlet Ecoregion
- stream type differences incorporated into the framework for assessment
- index development incorporating multiple community attributes
- water quality assessments for Cook Inlet Ecoregion
- database development compatible with STORET for the water quality information
- relationship between degradation and habitat quality
- nutrient enrichment issues
- impervious surface areas influences to water quality

Documentation and Further Information

Alaska's bioassessment program is being developed in conjunction with UAA-ENRI. For consistency and to avoid duplicate information, refer questions on protocols and reference sites to them. Their web site is:
http://www.uaa.alaska.edu/enri/bmap

Alaska Stream Condition Index: Biological Index Development for Cook Inlet, Summary 1997 - 2001, August 2001: http://www.uaa.alaska.edu/enri/bmap/pdfs/AK_SCI_2001.pdf

Quality Assurance Project Plan, Alaska Biological Monitoring and Assessment Program, February 2002:
http://www.uaa.alaska.edu/enri/bmap/pdfs/ENRI_QAPP_2-02.pdf

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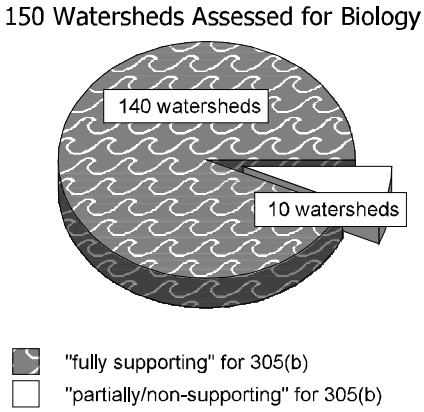
Programmatic Elements

Uses of bioassessment within overall water quality program	✓	problem identification (screening)
	✓	nonpoint source assessments
		monitoring the effectiveness of BMPs
		ALU determinations/ambient monitoring
		promulgated into state water quality standards as biocriteria
		support of antidegradation
		evaluation of discharge permit conditions
	✓	TMDL assessment and monitoring
		other:
Applicable monitoring designs	✓	targeted (i.e., sites selected for specific purpose) *(comprehensive use throughout jurisdiction, special projects and specific river basins or watersheds)*
		fixed station (i.e., water quality monitoring stations)
		probabilistic by stream order/catchment area
		probabilistic by ecoregion, or statewide
		rotating basin
		other:

Stream Miles

Total miles *(determined using National Hydrography Database)*	**>3 million**
Total perennial miles	unknown
Total watersheds assessed for biology	**150**
watersheds fully supporting for 305(b)	140
watersheds partially/non-supporting for 305(b)	10
watersheds listed for 303(d)	10
number of sites sampled	300
number of miles assessed per site*	10



*For the purposes of decision making, a 100 meter reach represents approximately 10 stream miles.

Aquatic Life Use (ALU) Designations and Decision-Making

ALU designation basis	Class system (A,B,C)–Every AK stream is designated for ALL uses (including drinking water) unless specifically exempted.	
ALU designations in state water quality standards	One designation in A: 3) aquaculture; One designation in C: 1) growth and propagation of fish, shellfish, other aquatic life, and wildlife	
Narrative Biocriteria in WQS	none	
Numeric Biocriteria in WQS	none	
Uses of bioassessment data in integrated assessments with other environmental data (e.g., toxicity testing and chemical specific criteria)	✓	assessment of aquatic resources
		cause and effect determinations
		permitted discharges
	✓	monitoring (e.g., improvements after mitigation)
	✓	watershed based management
Uses of bioassessment/ biocriteria in making management decisions regarding restoration of aquatic resources to a designated ALU	Alaska is just beginning to use bioassessment information to help with assessment/monitoring and in management decisions.	

Reference Site/Condition Development

Number of reference sites	**43 total**	
Reference site determinations	✓	site-specific
		paired watersheds
		regional (aggregate of sites)
	✓	professional judgment
		other:
Reference site criteria	no channelization; no upstream impoundments; no known point-source discharges; DO > 5 ppm; urban land use <15% in catchment; mining or logging in <15% of catchment; forest or natural land use >50% in catchment; riparian buffer width >18m	
Characterization of reference sites within a regional context		historical conditions
		least disturbed sites
		gradient response
		professional judgment
	✓	other: minimally disturbed*
Stream stratification within regional reference conditions	✓	ecoregions (or some aggregate)
		elevation
	✓	stream type
		multivariate grouping
		jurisdictional (i.e., statewide)
		other:
Additional information	✓	reference sites linked to ALU
		reference sites/condition referenced in water quality standards
		some reference sites represent acceptable human-induced conditions

*Alaska's reference sites are considered "minimally" disturbed; variation in results is due to natural and environmental influences.

Field and Lab Methods

Assemblages assessed	✓	benthos *(100 to 500 samples/year; single and multiple seasons, multiple sites - broad coverage)*
		fish
	UD	periphyton
		other:
Benthos		
sampling gear	d-frame; 200 - 400 micron mesh	
habitat selection	multihabitat	
subsample size	300-count target	
taxonomy	genus level	
Habitat assessments	visual based, hydrogeomorphology; performed with bioassessments	
Quality assurance program elements	standard operating procedures, quality assurance plan (in progress), periodic meetings and training for biologists, sorting and taxonomic proficiency checks, specimen archival	

Data Analysis and Interpretation

Data analysis tools and methods	✓	summary tables, illustrative graphs
		parametric ANOVAs
		multivariate analysis
	✓	biological metrics *(aggregate metrics into an index)*
		disturbance gradients
		other:
Multimetric thresholds		
transforming metrics into unitless scores	95^{th} percentile of all sites	
defining impairment in a multimetric index	first quartile from the 95^{th} percentile	
Evaluation of performance characteristics		repeat sampling
	✓	precision *(sampling replicates)*
		sensitivity
		bias
		accuracy
Biological data		
Storage	EDAS	
Retrieval and analysis	EDAS	